

### Purpose of Study

Immunizations are one of medicine's most important preventive tools. The 5 immunizations recommended for children today provide protection against 9 different diseases. Ongoing vigilance ensuring immunizations for children is essential to the public health goal of minimizing the occurrence of vaccine preventable illnesses and deaths. This study is part of the Michigan Department of Community Health's (MDCH) ongoing efforts to monitor immunization levels for the Medicaid population.

### Study Population

The study population for this immunization focus area is subject to age and enrollment criteria as follows:

- Children are included if their 2<sup>nd</sup> birthday occurred within the review period (1/1/2000 to 12/31/2000).
- Twelve months of continuous enrollment between the 1<sup>st</sup> and 2<sup>nd</sup> birthday in one of the health plans or FFS is required.

A random sample of 3,959 enrollee records was abstracted to allow extrapolation of the study results to the entire Medicaid population in Michigan. The precision of results varies slightly for each indicator, although most are reported with a 5% or smaller error bound.

### Study Questions

The immunization focus study is based on the following questions:

- Are enrollees fully immunized by the age of 2 years?
- Are enrollees fully immunized by the age of 3 years?

The answer to these questions involves assessing the status of 5 different immunizations:

1. Diphtheria, Tetanus and Pertussis (DTP) – an up to date status was recorded if 4 DTP vaccines were provided before 24 months of age.
2. Haemophilus influenzae type b (HIB) – an up to date status was recorded if 3 vaccines were provided before 2 years of age, or 1 after 15 months.
3. Oral polio vaccine / intramuscular polio vaccine (OPV/IPV) – an up to date status was recorded if 3 vaccines were provided before 2 years of age.
4. Hepatitis B (Hep B) – an up to date status was recorded if 3 vaccines were provided with 1 occurring after 6 months of age.
5. Measles, mumps and rubella (MMR) – an up to date status was recorded if 1 vaccine was provided between 12 and 24 months of age.

There are different dosing schedules and vaccine requirements for the 5 vaccines. The abstraction nurses recorded the dates immunizations were given. A computer program was used to compare the recorded dates to the requirements for an up to date status.

## Data Collection

The data for this study were collected from both the Michigan Childhood Immunization Registry (MCIR) and from the enrollee's medical record. The MCIR information system was authorized in 1996 and is available to both public and private health care providers.<sup>1</sup> It is designed to track the immunization status of all children in Michigan, regardless of who gave the immunizations or where they were given. Healthcare providers must either report all immunizations given or log in to the MCIR system and enter immunization information for the patients they serve. A key factor in the success of MCIR is provider participation, which is variable across the state.

MPRO first determined if a child's immunizations were up to date based on MCIR information provided by MDCH. If the immunizations were not up to date, or if no record of the child was found in the MCIR system, medical records were requested. Table 1.1 below shows the distribution of information sources. The overall immunization rate – using all available information – was 68%. Table 1.1 also displays the rate that would have resulted if the calculations were based only on a single source. For example, if only the enrollees for whom both MCIR and medical record information were included in the denominator, the immunization rate would have been 54%. The high immunization rate based only on MCIR information is impacted by 2 main issues: 1) medical records were only requested if MCIR information was not available or showed the enrollee as not up to date, and 2) since the information in MCIR is obtained from a variety of health care providers – physicians, hospitals, local health departments – more complete documentation may result.

<b>Table 1.1</b>			
<b>Immunization Information Source</b>			
<b>Information Source</b>	<b>Abstracted Records</b>	<b>% of Abstracted Records</b>	<b>Immunization Rate</b>
<b>MCIR overall rate *</b>	<b>3,822</b>	<b>96%</b>	<b>43%</b>
<b>MCIR only</b>	<b>2,268</b>	<b>57%</b>	<b>76%</b>
<b>MCIR &amp; Medical Record</b>	<b>1,554</b>	<b>39%</b>	<b>54%</b>
<b>Medical Record only</b>	<b>137</b>	<b>4%</b>	<b>56%</b>
<b>Total</b>	<b>3,959</b>	<b>100%</b>	<b>68%</b>

\* MCIR overall rate is calculated using the MCIR system's definition of up to date and only those enrollees registered in the MCIR system.

<sup>1</sup> Michigan Department of Community Health. Registry Reference: Michigan Childhood Immunization Registry.

The study showed that overall 96% of the enrollees were registered in the MCIR system. Some enrollees were registered in the MCIR system; but no immunizations were recorded. These records were included in the 96% MCIR registration rate. Eighty-five percent of those in the MCIR system had at least one immunization recorded. The proportion of enrollees registered in MCIR varied by health plan, but all had 92% or more of their enrollees registered. Individual health plan results are shown in Table 1.2.

<b>Table 1.2</b>			
<b>Immunization Information Source</b>			
<b>Health Plan</b>	<b>Enrollees</b>	<b>% Enrollees Registered in MCIR</b>	<b>% Enrollees with at least One Immunization in MCIR</b>
<b>Botsford</b>	<b>24</b>	<b>100%</b>	<b>100%</b>
<b>Cape</b>	<b>159</b>	<b>97%</b>	<b>87%</b>
<b>Care</b>	<b>151</b>	<b>95%</b>	<b>83%</b>
<b>CCP</b>	<b>199</b>	<b>97%</b>	<b>93%</b>
<b>CCM</b>	<b>265</b>	<b>98%</b>	<b>94%</b>
<b>FFS</b>	<b>294</b>	<b>97%</b>	<b>88%</b>
<b>GLHP</b>	<b>264</b>	<b>93%</b>	<b>72%</b>
<b>HP-M</b>	<b>119</b>	<b>100%</b>	<b>97%</b>
<b>Hplus</b>	<b>273</b>	<b>100%</b>	<b>94%</b>
<b>M-Care</b>	<b>131</b>	<b>96%</b>	<b>84%</b>
<b>McLaren</b>	<b>108</b>	<b>100%</b>	<b>85%</b>
<b>Midwest</b>	<b>139</b>	<b>92%</b>	<b>52%</b>
<b>Molina</b>	<b>196</b>	<b>96%</b>	<b>94%</b>
<b>Omni</b>	<b>211</b>	<b>97%</b>	<b>76%</b>
<b>PHP-Mid</b>	<b>220</b>	<b>97%</b>	<b>90%</b>
<b>PHP-SW</b>	<b>225</b>	<b>97%</b>	<b>87%</b>
<b>Priority</b>	<b>245</b>	<b>98%</b>	<b>88%</b>
<b>Total</b>	<b>176</b>	<b>93%</b>	<b>70%</b>
<b>UPHP</b>	<b>209</b>	<b>95%</b>	<b>84%</b>
<b>Wellness</b>	<b>351</b>	<b>96%</b>	<b>84%</b>
<b>Aggregate</b>	<b>3,959</b>	<b>96%</b>	<b>85%</b>

### **Limitations**

Selection criteria for enrollees identified for the immunization study have changed slightly from year to year. Selections for the past 2 years have required an office visit, but had different criteria specifying during what time period the office visit was to have taken place. The EQR 1999 study required that the enrollee have an office visit during the review period, which was calendar year 1999. In contrast, the 2000 EQR immunization study required that the office visit occur at some time between the enrollee's 1<sup>st</sup> and 2<sup>nd</sup> birthday.

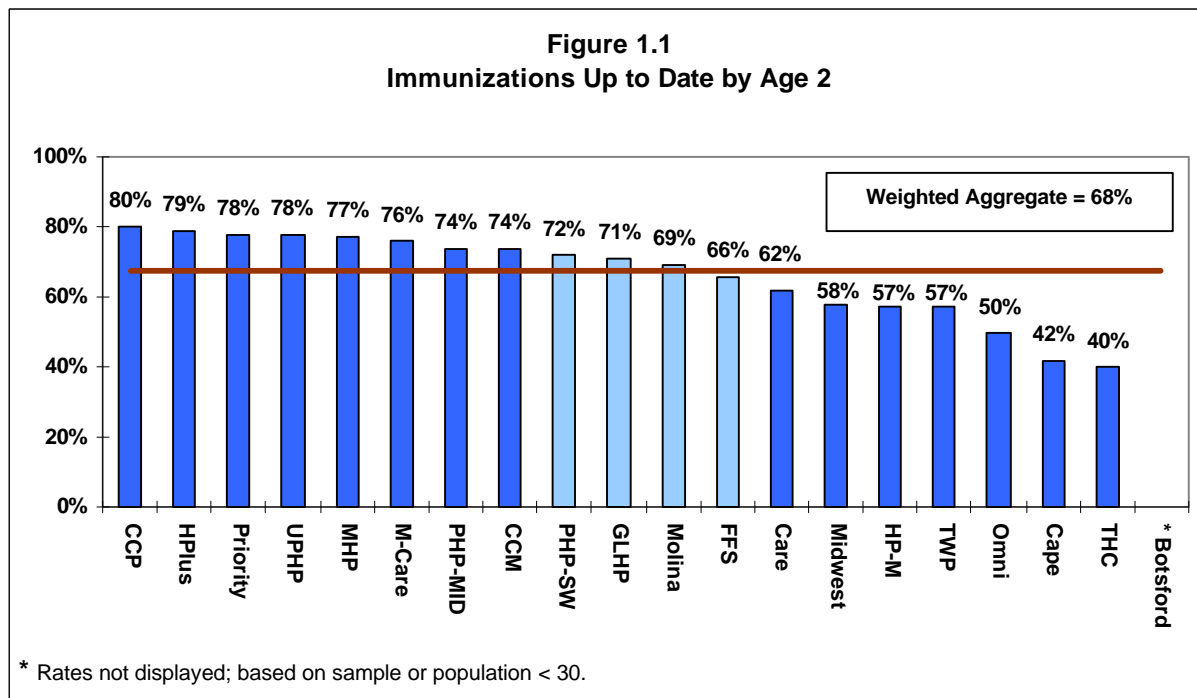
During the 1998 and 1999 reviews, immunization status was first collected from the medical record. If medical records were unavailable, the health plans were provided a list of enrollees with immunizations not up to date. The health plans had the option to follow up with health care

providers and check the MCIR system in order to supplement the abstracted data. Both MCIR and medical records served as sources for 2000 EQR, but the collection order was “reversed.” Enrollee immunization status was first checked in MCIR. Reports of records that were not up to date, or not registered in MCIR, were then provided to the health plans for follow up and to provide medical record information to supplement the MCIR reports.

The combined effects of the selection and collection differences used for EQR from 1998 to 2000 are not quantifiable. It is our considered opinion that the overall result of an apparent decrease in the immunization rate may be more a function of the study limitations, than of actual declines in adherence to immunization administration guidelines.

## Results

The weighted aggregate immunization rate for the review period was 68%. Rates ranged from a low of 40% to a high of 80%. Rates for 8 of the 20 health plans were above the 68% weighted aggregate, while the rates for 7 health plans fell below the weighted aggregate as shown in Figure 1.1.



Seven health plans with rates above the EQR 1999 weighted aggregate had rates in the upper-range for 2000 EQR as well. In 1999 Botsford's rate was above the aggregate, but their rate is not reported this year due to small population size. Similarly, McLaren Health Plan is ranked above the weighted aggregate this year, but last year a rate was not reported. Weighted aggregate immunization rates for 1998 to 2000 are shown in Table 1.3 below.

<b>Table 1.3</b>	
<b>Historical Immunization Rates</b>	
<b>Review Period</b>	<b>Rate</b>
<b>1998</b>	<b>75%</b>
<b>1999</b>	<b>73%</b>
<b>2000</b>	<b>68%</b>

Rates for individual series are shown below in Table 1.4. The weighted aggregate rate for all immunizations up to date by age 2 was lower than any one of the individually completed immunization series because full immunization required that the enrollee complete every series. For example, enrollees who completed the DTP series will not necessarily be the same enrollees who completed the OPV series.

<b>Table 1.4</b>	
<b>Individual Immunization Series</b>	
<b>Immunization</b>	<b>Rate</b>
<b>DTP</b>	<b>74%</b>
<b>HIB</b>	<b>90%</b>
<b>OPV/IPV</b>	<b>83%</b>
<b>Hep B</b>	<b>82%</b>
<b>MMR</b>	<b>85%</b>

The DTP individual series weighted aggregate rate of 74% was the lowest of the individual series' rates. DTP is the only vaccine required at 4 intervals. The HIB vaccine rate is the highest at 90%. Table 1.5 shows the individual series rates for the past 3 years.

<b>Table 1.5</b>			
<b>Weighted Aggregate Rate</b>			
<b>Immunization</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
<b>DTP</b>	<b>81%</b>	<b>78%</b>	<b>74%</b>
<b>HIB</b>	<b>87%</b>	<b>91%</b>	<b>90%</b>
<b>OPV</b>	<b>88%</b>	<b>87%</b>	<b>83%</b>
<b>Hep B</b>	<b>89%</b>	<b>89%</b>	<b>82%</b>
<b>MMR</b>	<b>90%</b>	<b>88%</b>	<b>85%</b>

Table 1.6 below shows the completion rates by age 2 for each vaccine. The 14 percentage point decrease between enrollees receiving at least 3 doses and enrollees receiving 4 doses of DTP by age 2 suggests an area where quality improvement efforts might be focused. The 8 percentage point drop for OPV/IPV immunization follows the same pattern, and may also indicate the need for quality improvement efforts. Percentage point changes between other doses in DTP and other series are typically 2 – 4 points.

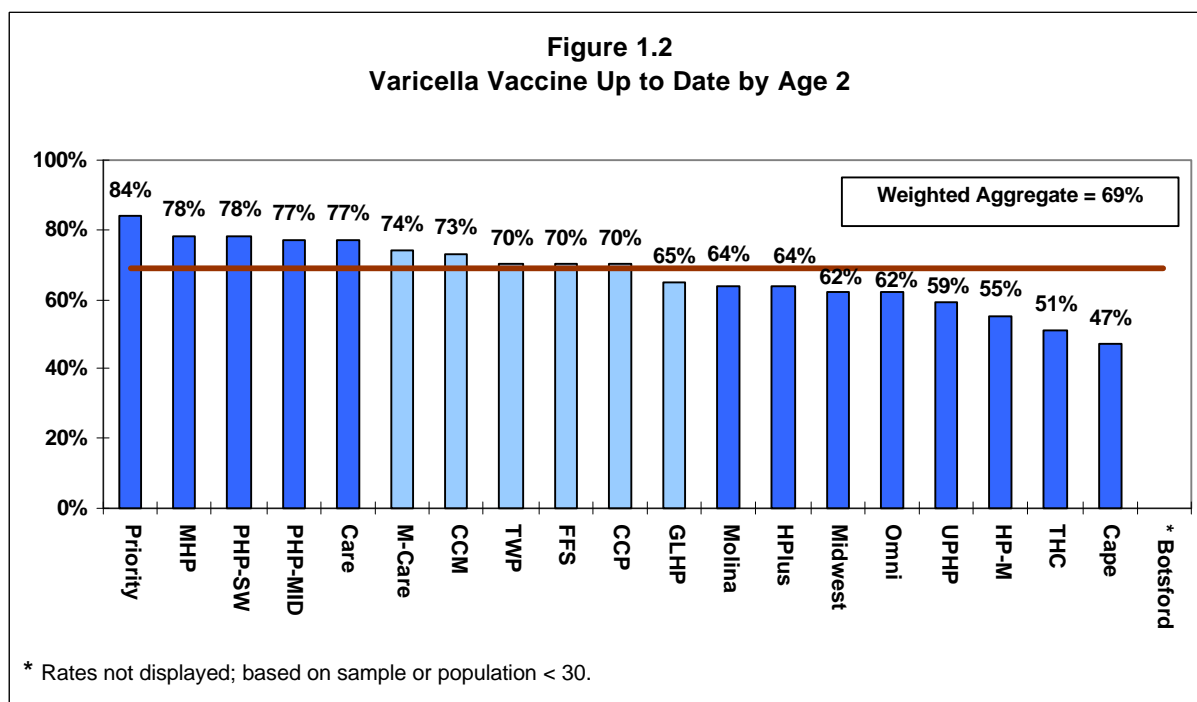
<b>Table 1.6</b>				
<b>Enrollees Immunized by Dose</b>				
<b>Immunization</b>	<b>Dose 1</b>	<b>Dose 2</b>	<b>Dose 3</b>	<b>Dose 4</b>
<b>DTP</b>	<b>94%</b>	<b>92%</b>	<b>88%</b>	<b>74%</b>
<b>HIB</b>	<b>94%</b>	<b>92%</b>	<b>90%</b>	<b>(na)</b>
<b>OPV/IPV</b>	<b>94%</b>	<b>91%</b>	<b>83%</b>	<b>(na)</b>
<b>Hep B</b>	<b>87%</b>	<b>86%</b>	<b>82%</b>	<b>(na)</b>
<b>MMR</b>	<b>85%</b>	<b>(na)</b>	<b>(na)</b>	<b>(na)</b>

Additional calculations were made to determine the number of children who received all of their immunizations, but received one or more of the doses a few days early. Including these children in the numerator resulted in slightly higher rates for Hep B, increasing 3 percentage points, and MMR, which increased 1 percentage point. The overall immunization rate increased, for the up to date by age 2 rate, to 70%.

An additional calculation that provides information on the number of children who are benefiting from immunizations is the rate of immunization for children up to date by age 3. The weighted aggregate rate for all immunizations up to date by age 3 was 76% for 2000 EQR.

Varicella (chicken pox) immunization data were first collected for the 1999 EQR. Varicella immunization data were also collected for this 2000 EQR review. The weighted aggregate rate for 2000 EQR was 69%. This result is significantly higher than the 52% weighted aggregate rate for 1999.

Individual health plan results for 2000 EQR are shown in Figure 1.2 below. Two of the health plans in the upper-range (Priority Health, Care Choices HMO) ranked in the upper-range last year as well. PHP of Southwest Michigan and PHP of Mid-Michigan moved from the mid-range to the upper-range. McLaren Health Plan rates were not reported last year because they were based on fewer than 30 enrollees.



## Discussion

Although this report suggests that immunization rates have declined in Michigan in 2000, the following factors should be considered. First, study methods changed in 2000 to be more consistent with the methods used by NCQA to collect and report immunization data. Second, the EQR immunization study demonstrates that the aggregate Medicaid immunization rate is 6 percentage points below the State average of 74% and 6 percentage points above the City of Detroit aggregate of 62%.<sup>2</sup>

<sup>2</sup> National Immunization Program. List of Tables: January - December 2000. [Web Page]; <http://www.cdc.gov/nip/coverage/tables/00/toc-00.htm>. [Accessed 12 Nov 2001].

The frequency of MCIR use is also worthy of some discussion. MCIR continues to provide valuable information when used. The 2000 EQR study found that the overall MCIR immunization rate was 43%. There appears to be a relationship between MCIR use and immunization rates. Greater emphasis on MCIR use by the health plans and their physicians in monitoring childhood immunizations may have a positive impact on individual and overall immunization rates.